Complete Summary

GUIDELINE TITLE

Hypertension.

BIBLIOGRAPHIC SOURCE(S)

Texas Tech University Managed Health Care Network Pharmacy & Therapeutics Committee. Hypertension. Conroe (TX): University of Texas Medical Branch Correctional Managed Care; 2002 Apr. 6 p. [1 reference]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Hypertension

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Risk Assessment
Screening
Treatment

CLINICAL SPECIALTY

Family Practice
Internal Medicine

INTENDED USERS

Health Care Providers
Pharmacists
Physicians

GUIDELINE OBJECTIVE(S)

To present guidelines on the detection, evaluation, and management of hypertension in incarcerated offenders within the Texas Department of Criminal Justice

TARGET POPULATION

Incarcerated offenders within the Texas Department of Criminal Justice with hypertension or at risk for hypertension

INTERVENTIONS AND PRACTICES CONSIDERED

Screening and Assessment

1. Medical history, including risk factor stratification and detection of comorbidities
2. Physical examination and blood pressure reading
3. Laboratory tests to evaluate for target organ disease and comorbidities
    - Urinalysis
    - Complete blood count
    - Chemistry panel
    - Fasting lipid profile (cardiac risk)
4. Electrocardiogram (EKG)

Treatment

1. Pharmacologic treatment
    - Diuretics (Furosemide, Hydrochlorothiazide, Metolazone, Triamterene)
    - Beta blockers (Atenolol, Metoprolol, Propranolol)
    - Calcium channel blockers (Amlodipine, Diltiazem, Verapamil)
    - Alpha-1 blockers (Doxazosin)
    - Alpha-2 agonists (Clonidine)
    - Angiotensin-converting enzyme (ACE) inhibitors (Captopril, Enalapril)
    - Other agents (Minoxidil)
2. Education in lifestyle modification (e.g., weight management, exercise, specified diet modifications, smoking cessation, limitation of alcohol intake)
3. Ongoing monitoring of blood pressure and follow-up
4. Specialist referral, pharmacotherapy consult, or stabilization in infirmary setting, if indicated

Management of Hypertension Emergency

1. Parenteral antihypertensive agents
2. Reduction of mean arterial blood pressure no more than 25% within minutes to two hours then towards 160/100 mm Hg in 2 to 6 hours, avoiding excessive falls in pressure

Management of Hypertension Urgency

1. Assessments
    - Medical history
    - Physical examination
        - Blood pressure reading in both arms
        - Chest exam, including evaluation of heart, lungs, neck veins, optic fundi, and pulse points
    - Neurological exam
    - Electrocardiogram (EKG)
    - Laboratory tests
        - Chemistry panel
        - Complete blood count (CBC)
        - Urinalysis
2. Treatments
    - Elevation of patient/head of bed to 45 degrees
    - Intravenous (IV) line insertion
    - Pharmacologic therapy with immediate-release oral hypotensive agents
        - Furosemide
        - Atenolol
        - Captopril
        - Verapamil
        - Diltiazem
        - Clonidine
    - Monitoring at regular intervals during observation period and, if indicated, multiple drug dosing
    - Disposition
        - Transfer to nearest emergency room via ambulance, if indicated
        - Discharge with next-day follow-up

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Not stated

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not applicable

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Please note: This guideline has been updated. The National Guideline Clearinghouse is working to update this summary.

Many of the major recommendations are presented in algorithms:

- Hypertension
- Hypertension Urgency

Risk Stratification and Treatment*

- Risk Group A (No risk factors; No TOD/CCD**)

  Blood Pressure High-Normal (130-139/85-89) -- Lifestyle modifications

  Blood Pressure Stage 1 (140-159/90-99) -- Lifestyle modification (up to 12 mos.)

  Blood Pressure Stage 2 & 3 (>160/>100) -- Drug therapy

- Risk Group B (At least 1 risk factor, not including diabetes; No TOD/CCD)

  Blood Pressure High-Normal (130-139/85-89) -- Lifestyle modifications

  Blood Pressure Stage 1 (140-159/90-99) -- Lifestyle modification (up to 6 mos.)***

  Blood Pressure Stage 2 & 3 (>160/>100) -- Drug therapy

- Risk Group C (TOD/CCD and/or diabetes, with or without other risk factors)

  Blood Pressure High-Normal (130-139/85-89) -- Drug therapy****

  Blood Pressure Stage 1 (140-159/90-99) -- Drug therapy

  Blood Pressure Stage 2 & 3 (>160/>100) -- Drug therapy

*Lifestyle modification should be adjunctive therapy for all patients recommended for pharmacologic therapy.

**TOD/CCD indicates target organ disease/clinical cardiovascular disease.

***For patients with multiple risk factors, clinicians should consider drugs as initial therapy plus lifestyle modifications.

****For those with heart failure, renal insufficiency, or diabetes.

Co-Morbidity Factors

Patient Co-morbidity or Demographics Which Represent Indications for Drug Therapy Modification

- Isolated systolic hypertension -- Start with diuretic (hydrochlorothiazide [HCTZ] 25 mg QD).
- Angina pectoris -- Start with beta blocker (Atenolol, Metoprolol), then calcium channel antagonist (CCA) (Verapamil, Diltiazem).
- Congestive heart failure (CHF) or ejection fraction <40% -- Start with angiotensin-converting enzyme (ACE) inhibitor (should be used even if on diuretic already).

- Diabetes mellitus -- Start with ACE inhibitor (Captopril, Enalapril). Maintain blood pressure (BP) <130/80.
- Renal insufficiency -- (Serum creatinine [Scr] > 2.5 MG/dL) -- Start with a loop diuretic (furosemide), beta-blocker or CCA (Verapamil & Diltiazem preferred), ACE inhibitor use is a relative contraindication in ACE inhibitor naive patient. Maintain blood pressure <130/85.
- Post myocardial infarction -- Start with NON-ISA (i.e., without intrinsic sympathomimetic activity) beta blocker (Metoprolol).
- Peripheral vascular disease -- Start with CCA (Verapamil, Diltiazem)
- Benign prostatic hypertrophy -- Start with Alpha blocker (Doxazosin)
- Dyslipidemia -- Alpha agonist (Clonidine), Alpha blocker (Doxazosin), ACE inhibitor or CCA.
- Vascular headaches -- Start with beta-blocker (Atenolol, Metoprolol) or CCA (Verapamil, Diltiazem).
- Asthma or chronic obstructive pulmonary disease (COPD) -- Start with diuretic, beta-blocker is relative contraindication.
- Hyperuricemia or gout -- Start with beta-blocker, diuretic is relative contraindication.

Hypertension Emergency (see Hypertension Urgency Algorithm)

Hypertension emergencies occur rarely, but immediate blood pressure reduction is required to diminish the progression of target organ damage. Target organ damage may be manifested as hypertensive encephalopathy, intracranial hemorrhage, unstable angina pectoris, acute myocardial infarction, acute left ventricular failure with pulmonary edema, dissecting aortic aneurysm, acute renal failure or eclampsia. Most hypertensive emergencies are treated initially with parenteral agents. Blood pressure reduction does not need to reach the normal range immediately. The initial goal of therapy is to reduce the mean arterial blood pressure by no more than 25% (within minutes to 2 hours), then toward 160/100 mm Hg within 2 to 6 hours, avoiding excessive falls in pressure that may precipitate renal, cerebral, or coronary ischemia.

Hypertension Urgency (see Hypertension Urgency Algorithm)

Hypertensive urgencies are described as episodes of asymptomatic severe blood pressure elevation that should be reduced within several hours. Blood pressure readings in the upper level of stage 3 (systolic > 210 mm Hg and/or diastolic > 120 mm Hg) are considered hypertensive urgencies. Elevated blood pressure alone, in absence of symptoms or new or progressive target organ damage, rarely requires emergency therapy. Hypertensive urgencies can be managed with oral doses of drugs which have a relative fast onset of action. The choices include oral loop diuretics, beta-blockers, ace-inhibitors, alpha2-agonists, or calcium channel antagonists.

Hypertension Disease Management Guidelines

Detection and Confirmation

The following procedures are recommended for the detection and confirmation of hypertension:

- Patients should be seated in a chair with their backs supported and their arms bared and supported at heart level. Patients should have refrained from smoking or ingesting caffeine during the 30 minutes prior to the reading.
- Blood pressure (BP) measurement should begin after the patient has been at rest for at least 5 minutes.
- Appropriate cuff size must be used to ensure accurate readings. The bladder within the cuff should encircle at least 80% of the arm. A large adult cuff should be kept in all clinics.
- Measurement of blood pressure with a mercury sphygmomanometer is the preferred method. However, a recently calibrated aneroid manometer or a validated electronic device can be used.
- Systolic blood pressure (SBP) and diastolic blood pressure (DBP) should be recorded.
- Two or more readings separated by 2 minutes should be obtained and averaged for proper confirmation. If these two readings differ by more than 5 mm Hg, additional readings should be obtained two weeks apart.

The following recommendations for follow-up are based on initial blood pressure readings.

Initial blood pressure (mm Hg)* and Recommended Follow-up Schedule**

- Systolic <130; Diastolic<85 -- Recheck in two years
- Systolic 130-139; Diastolic 85-89 -- Recheck in 1 year**
- Systolic 140-159; Diastolic 90-99 -- Confirm within 2 months**
- Systolic 160-179; Diastolic 100-109 -- Evaluate or refer to source of care within 1 month
- Systolic $\geq$ 180; Diastolic $\geq$ 110 -- Evaluate or refer to source of care immediately or within 1 week depending upon clinical situation

*If systolic and diastolic categories are different, follow up should be for the shorter time (e.g. 160/86 mm Hg should be evaluated or referred within one month).

**Modify the scheduling for follow up according to reliable information about past blood pressure measurements, other cardiovascular risk factors, or target organ disease.

***Provide advice about lifestyle modifications.

Medical History

- Known duration and levels of elevated blood pressure
- Patient history or symptoms of coronary heart disease (CHD), heart failure, cerebrovascular disease, peripheral vascular disease, renal disease, diabetes mellitus, dyslipidemia, gout, or sexual dysfunction
- Family history of high blood pressure, premature coronary heart disease, stroke, diabetes, dyslipidemia, or renal disease
- Symptoms suggestive of hypertension (headache, nose bleeds, dizziness, abnormal physical exam)

- History of recent changes in weight, leisure time physical activity, and smoking or tobacco use
- Dietary assessment including intake of sodium, alcohol, saturated fat and caffeine
- History of all prescribed and over-the-counter (OTC) medication, herbal remedies, and illicit drugs
- Results and adverse effects of past antihypertensive therapy
- Psychosocial and environmental factors that may influence hypertensive control

Physical Exam

- Two or more blood pressure readings separated by 2 minutes with the patient supine or seated
- Verification in the contralateral arm (if values are different, the higher value should be used)
- Measurement of weight, height, and waist circumference
- Fundoscopic examination for hypertensive retinopathy (i.e., arteriolar narrowing, focal arteriolar constrictions, arteriovenous crossing changes, hemorrhages and exudates, disc edema)
- Examination for the neck for carotid bruits, distended veins, or enlarged thyroid gland
- Examinations of the heart for abnormalities in the rate and rhythm, increased size, precordial heave, clicks, murmurs and third and fourth heart sounds
- Examination of the lungs for rales and evidence for bronchospasm
- Examination of the abdomen for bruits, enlarged kidney, masses and abnormal aortic pulsation
- Examination of the extremities for diminished or absent peripheral arterial pulsations, bruits, and edema
- Neurological assessment

Routine Laboratory Test

Routine laboratory test recommended prior to initiating therapy and annually to determine end organ damage and other risk factors include:

- Urinalysis (UA)
- Complete blood count (CBC)
- Chemistry panel (e.g., Chem 20)
- Fasting lipid profile (cardiac risk panel)
- Electrocardiogram (EKG)

Secondary Causes of Hypertension

- Renal disease
- Coarctation of the aorta
- Primary aldosteronism
- Cushing´s syndrome
- Pheochromocytoma
- Pregnancy
- Drug-induced

Life Style Modification

- Lose weight if over weight
- Increase aerobic activity (30-45 minutes most days of the week)
- Reduce sodium intake
- Maintain adequate intake of dietary potassium
- Maintain adequate intake of dietary calcium and magnesium for general health
- Stop smoking and reduce intake of dietary saturated fat and cholesterol for overall cardiovascular health
- Limit alcohol intake

CLINICAL ALGORITHM(S)

Algorithms are provided for:

- Hypertension
- Hypertension Urgency

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

This guideline was adapted from the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI). Arch Intern Med 1997;157:2413-2446.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Improved detection and appropriate evaluation and management of hypertension in incarcerated offenders within the Texas Department of Criminal Justice

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The pathways do not replace sound clinical judgement nor are they intended to strictly apply to all patients.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Texas Tech University Managed Health Care Network Pharmacy & Therapeutics Committee. Hypertension. Conroe (TX): University of Texas Medical Branch Correctional Managed Care; 2002 Apr. 6 p. [1 reference]

ADAPTATION

This guideline was adapted from the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The sixth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VI). Arch Intern Med 1997;157:2413-2446.

DATE RELEASED

1997 Mar (revised 2002 Apr)

GUIDELINE DEVELOPER(S)

University of Texas Medical Branch Correctional Managed Care - Academic Institution

SOURCE(S) OF FUNDING

University of Texas Medical Branch Correctional Managed Care

GUIDELINE COMMITTEE

Clinical Guidelines Committee on Hypertension

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Members: Owen Murray, DO; Edward Coffey, RPh; Renee Lenz, PharmD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

Please note: This guideline has been updated. The National Guideline Clearinghouse is working to update this summary.

GUIDELINE AVAILABILITY

Print copies: Available from University of Texas Medical Branch (UTMB), 3009A HWY 30 West, Huntsville, TX, 77340.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on March 12, 2003. The information was verified by the guideline developer on March 24, 2003.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 4/12/2004

FIRSTGOV